DOCUMENT RESUME

ED 425 559 EC 306 221

| | |
|---|---|
| TITLE | Prevention of Neural Tube Defects. ARC Q&A #101-45. |
| INSTITUTION | Arc, Arlington, TX. |
| PUB DATE | 1994-12-00 |
| NOTE | 4p. |
| AVAILABLE FROM | Arc National Headquarters, 500 E. Border St., S-300, Arlington, TX 76010; Tel:: 817-261-6003; TDD: 817-277-0553. |
| PUB TYPE | Guides - Non-Classroom (055) |
| EDRS PRICE | EDRS Price MF01 Plus Postage. PC Not Available from EDRS. |
| DESCRIPTORS | Congenital Impairments; Incidence; *Neurological Impairments; Nutrition; Pregnancy; Prenatal Influences; *Prevention; *Spina Bifida |
| IDENTIFIERS | *Anencephaly; *Folic Acid Deficiency |

ABSTRACT

This fact sheet uses a question-and-answer format to summarize issues related to the prevention of neural tube defects. Questions and answers address the following topics: what neural tube defects are and the most common types (spina bifida and anencephaly); occurrence of neural tube defects during the first month of pregnancy; the frequency of neural tube defects (about 2,500 each year in the United States); prevention of a neural tube defect pregnancy through the consumption of folic acid before and during pregnancy; foods which contain folic acid; people at greater risk of having low folic acid levels (smokers and users of alcohol/drugs); recommendations for folic acid supplementation for women of child-bearing age; the special importance of folic acid for women who have already had a pregnancy affected by neural tube defects; other possible causes of neural tube defects; and prenatal screening to detect neural tube defects. (DB)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

# Prevention of Neural Tube Defects

## ARC Q&A #101-45

ED 425 559

The Arc
A national organization on mental retardation

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

S. A. Davis

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

EC 306 221

The Arc

*a national organization on mental retardation*

Q&A

# Prevention of Neural Tube Defects

## What are neural tube defects (NTDs)?

A neural tube defect is a birth defect occurring in the brain or spinal cord (backbone). NTDs are among the most common of all serious birth defects. The neural tube is the part of the fetus that becomes the spinal cord and brain.

The two major types of NTDs are anencephaly and spina bifida. Anencephaly is the partial or complete absence of the baby's brain. This birth defect causes extensive damage to the fetus, and most of these babies are stillborn or die soon after birth.

Spina bifida occurs when there is an opening of the spine. These babies need to have surgery soon after their birth to close the spine and prevent further damage. They also may need a shunt or a drain to prevent a build-up of spinal fluid in the brain called hydrocephalus. Babies with spina bifida may lack feeling in their legs and later develop problems with walking. In addition, these children may develop problems with their bowel and bladder control. One study of the effects of spina bifida found that 41 percent of children born with spina bifida died before their 16th birthday. This study also found that 20 percent of children who did not die had mental retardation, 30 percent needed wheelchairs, and 44 percent were incontinent (Hunt, 1990).

## When do NTDs occur in the development of the baby?

These defects occur very early, usually in the first month of pregnancy. During the first four weeks of pregnancy, the neural tube is open and then closes to form the spinal cord and brain. In NTD affected pregnancies the neural tube does not close properly, and this causes very serious and permanent damage in the baby. Most women don't even realize they are pregnant during this first month of pregnancy when the neural tube is developing into the brain and spinal cord.

## How frequently do NTDS occur?

In the United States about 2,500 babies are born each year with NTDs, about 6 in every 10,000 live births. This is a decline from 1970 when about 13 in every 10,000 live births resulted in a neural tube defect. Ninety percent of babies born with NTDs are born into families where this has never happened before. Seventy-five percent of NTD affected pregnancies end in miscarriage or stillbirth, and only 25 percent of these infants are born alive. Both genetic (inherited) and environmental factors are believed to cause neural tube defects.

Studies have shown that the following people are at an increased risk of having an NTD affected pregnancy:

- Caucasians with English/Irish ancestry
- people who do not eat well-balanced diets
- couples who have already had other NTD affected pregnancies
- women who have low folic acid levels before they become pregnant and during the earliest weeks of pregnancy.

## How can a NTD pregnancy be prevented?

Recent studies have shown that women who take the B vitamin, folic acid, before pregnancy and during the first two months of pregnancy can reduce the risk of serious birth defects of the brain and spinal cord. By taking a safe and readily available multivitamin pill with folic acid every day there is a 50 percent or greater chance of preventing NTDs.

## What is folic acid, and where is it found?

Folic acid is a B vitamin also known as folate or folacin. Folic acid is needed to make new cells in the body, and it can be found in most multivitamins and also in certain foods.

Folic acid found in foods is called folate and is present in a wide variety of foods. The following foods are high in folic acid:

- peas, corn and dried beans
- dark green leafy vegetables
- white and whole wheat breads
- beef liver and lean beef
- bananas
- fortified breakfast cereals
- orange juice

Women whose diets follow the USDA's Food Guide Pyramid are more likely to eat 0.4 mg of folate daily. It is recommended that all women able to have a baby take a multivitamin pill with folic acid in addition to eating foods high in folate because overcooking can destroy folate in food, and the amount of folate absorbed from food varies. A daily multivitamin pill can guarantee that a woman is receiving the right amount of folic acid.

EC 306221



National Headquarters, 500 E. Border St., S-300, Arlington, Texas 76010, 817/261-6003•817/277-0553 (TDD)

## What people are at greater risk of having low folic acid levels?

Some poor personal habits may cause people to have lower levels of folic acid in their bodies. It has been found that people in the following categories have decreased amounts of folic acid and need to remember to take a multivitamin pill with folic acid every day:

- people with poor eating habits
- people who are dieting severely, anorexics and bulemics
- cigarette smokers
- alcohol and drug users
- birth control pill users

People with poor eating habits and those on a diet may not be getting adequate amounts of folic acid in their diets. Drug and alcohol users often do not eat a well-balanced diet. Studies have shown that cigarette smoking, excessive drinking of alcohol and long use of birth control pills actually lower the amount of folic acid in a person's body. If you fall into any of these categories, it is even more important that you take a multivitamin with folic acid every day.

## What are the recommendations for folic acid supplementation for women of child-bearing age?

The Centers for Disease Control and Prevention have made the following recommendations for *all women capable of having a baby*:

*Take a daily multivitamin pill containing 400 mcg(0.4 mg) of folic acid.* You can get a multivitamin pill with 400 mcg (0.4 mg) of folic acid without a prescription, or you may get a prescription from your doctor. Before taking a multivitamin without a prescription, read the label on the bottle to make sure 400 mcg (0.4 mg) folic acid is included in this pill.

*Do not take more than one multivitamin pill without discussing this with your doctor, nurse or dietitian.* Taking more than one multivitamin pill may be harmful to you and your unborn baby.

*If you become pregnant, continue the multivitamin pill with folic acid until your first pregnancy exam.* You will learn about prenatal vitamins at this time, and they also contain 400 mcg (0.4 mg) of folic acid.

## Is there a danger of getting too much folic acid?

Folic acid is a very safe vitamin. There should be no danger in taking a multivitamin containing 400 mcg (0.4 mg) of folic acid and eating a balanced diet which contains foods with folic acid.

## Can folic acid help if you already had a previous NTD affected pregnancy?

Women who have had a baby with a neural tube defect have a two to three percent chance of having another NTD affected pregnancy. Folic acid has been found to reduce greatly the risk of another NTD affected pregnancy in these women. However, a major study revealed that about 25 percent of NTD recurrences will not be helped with folic acid supplementation (Federal Register, 1993).

If you are planning to become pregnant, you need to speak with your doctor or nurse midwife about your increased risk. Your doctor or nurse midwife will discuss the increased amount of folic acid you need to take daily.

## What are other possible causes of NTDs?

It is well recognized that NTDs may be caused by a number of environmental agents and genetic factors. Other nutritional factors other than folate have also been suggested as causes of NTDs, including vitamin B12 and pantothenic acid deficiency. Poor maternal health and exposure to environmental pollutants have been implicated as increasing risk of NTDs in certain areas of the country (Federal Register, 1993).

The Public Health Service recommends that pregnant women who use folic acid supplements still be offered prenatal screening for neural tube defects (Lin-Fu & Anthony, 1993).

## What prenatal screening detects NTDS?

A blood test given during pregnancy is able to detect NTDs. This blood test is called Maternal Serum Alpha-fetoprotein (MSAFP) and is now available for all women at 16 weeks of pregnancy. Alpha-fetoprotein (AFP) is a chemical made by the fetus that enters the mother's blood. A large amount of AFP may mean the fetus has an NTD. While this blood test detects up to 90 percent of NTDs, it is only a screening test. There are other tests available that can be used to diagnose NTDs during pregnancy which you can discuss with your doctor or nurse midwife.

*Prepared by the Health, Research and Education Trust of the New Jersey Hospital Association and The University of Medicine and Dentistry of New Jersey, Department of Genetics.*

*Donated by the New Jersey Governor's Council on the Prevention of Mental Retardation and Developmental Disabilities.*

## References

Federal Register. "Folic Acid. Proposed Rules." Pgs. 53254-53317. Thursday, Oct. 14, 1993.

Hunt, G.M. "Open Spina Bifida Outcome for a Complete Cohort Treated Unselectively and Followed Into Adulthood." Developmental Medicine and Child Neurology. Vol. 32, No. 2, pgs. 108-118. Feb. 1990.

Lin-Fu, J.S., M.A. Anthony. "Folic Acid and Neural Tube Defects: A Fact Sheet for Health Care Providers." Maternal and Child Health Bureau, Health Resources and Services Administration, Public Health Service. May 1993.